Request-reply Page

Diagnostic application

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Introduction

This application was originally developed to measure the timing for satisfying one-shot requests for data, especially across the network. It permits specification of a general data request using a given listype#, initial ident (including node#) , #idents and #bytes/ident. The one-shot request is repeated at 15 Hz, and the measured time from the before request until after the reply is measured and updated as a histogram in 0.5 msec bins over a 20 msec range.

Display layout

```
 0   R REQUEST-REPLY   12/19/89 1022
 1   IDENT<0508:0103>      N<  1>
 2   LT<  0>#B<   2>= 0000
 3
 4        0  0    0  5    0 10    0 15
 5        0      156       0       0
 6        0  1   267  6    0 11    0 16
 7        0       30       0       0
 8        0  2    3  7    0 12    0 17
 9        0       0        0       0
10        0  3    0  8    0 13    0 18
11        0       0        0       0
12        0  4    0  9    0 14    0 19
13        0       0        0       0
14
```

The ID field on line 1 is the ident in hexadecimal. In this case, it means channel `0x0103` in node `0x0508`. The `N` field is the count of sequential idents beginning with the given ident. The `LT` field is the listype# in decimal. The `#B` field is the number of bytes requested per ident in decimal. The value shown in hexadecimal after the equal sign is the first part of the returned data. Up to 16 bytes can be displayed on two lines.

Ident format

The format of an ident can be one of these two types:

Format entered	*Internal form*	*Example of use*
`0508:0204`	`0508 0204`	"chan"
`0508:001A0000`	`0508 001A 0000`	"addr"

One ident type for which entry is not supported is the analog channel name. This support might be a good addition to the program, since name searches are currently performed in simple linear fashion and can take awhile to execute.

Timing histogram

The time delay for the one-shot data requests made each 15 Hz cycle is tallied and displayed in histogram form on 10 lines, where the 40 bins of data counts are listed in 4 columns. Every other bin is labelled with a number in msec units, since the time values are measured in 0.5 msec units.

A free-running counter on the 68901 chip on the Crate Utility Card that counts at 2000 Hz is used to measure the elapsed time. The counter is sampled just before the call to `ReqData` that makes the data request, and it is sampled again just after the call to `Collect` which delivers the response data to the caller. The difference is what is histogrammed.

By varying the parameters such as the #bytes requested per ident and the number of idents, one can gain some good insight into the detailed timing dependencies of data requests.

Typical timing results for a simple data request such as requesting a single two-byte reading of an analog channel from a node on the token ring give a typical elapsed time of about 6 msec. One should consider that the network chipset requires about 1 msec to pass the shortest frame, and there are 4 passes through the chipset that are involved in this data request. If one makes the same request for a local channel's reading, the timing result is about 1 msec.

It is also of interest to observe the build-up of the distribution of elapsed times. When the nodes are not operating synchronously—driven by the same external interrupt—the one-shot data request can be used as a "probe" to get an idea of the amount of activity that occurs in the target station. Of course, a more direct means of getting that information is to examine the signals from the task lights and interrupt lights on the Crate Utility Board's front panel connector.

Another use for this application is to test new listypes which do not have local applications that use those listypes. Such listypes may be implemented for the use of Host computers. In fact, this application is currently the only one which allows user entry of a listype#. Other applications use fixed listypes as needed for the data they are designed to access.